

Power BI Dashboard Report: PulseShop Sales Analysis

1. Executive Summary

This report outlines the development of an interactive Power BI dashboard for PulseShop, analyzing sales data from October 2022 to October 2024. The dashboard delivers actionable insights into sales performance, product categories, regional trends, and sales representative contributions, empowering data-driven decision-making. The project involved data preparation, transformation, modeling, DAX calculations, and the design of four dashboard pages: Overview, Trends Analysis, Performance Details, and Insights & Recommendations. Key features include a dynamic date slicer with a bookmark, a parameter for toggling sales and profit visuals, and a comprehensive Insights & Recommendations page with actionable strategies to enhance sales performance.

2. Data Preparation and Transformation

2.1 Initial Data Assessment

The dataset, provided in PulseShop sales.xlsx, was generally clean but required specific transformations:

- The dataset included transactional and dimensional data.
- The Date column needed conversion into a proper Date format and additional attributes for time-based analysis.

2.2 Data Import and Transformation in Power Query

- **Data Import:** Imported the dataset into Power BI using the Excel connector.
- **Power Query Transformations:**
 - **Date Column:** Converted the Date column into a proper Date format to enable a date hierarchy.
 - **Table Splitting:**
 - Split the dataset into a fact table (Fact_Orders) for transactional data (e.g., sales, profits, quantities) and dimension tables (Dim tables) for contextual data (e.g., products, regions, sales reps).
 - Ensured all dimension tables had unique values to maintain data integrity.
 - **Date Dimension Tables:**

- Created Dim_Date with columns: Order Date, Year, Month, Month Name, Quarter, Week of Year, Week of Month, Day, Day of Week, and Day Name.
- Created Dim_Date_Time with columns: Time, Hour, Minutes, and Time of Day (e.g., Morning, Afternoon, Evening, Night).
- **Additional Adjustments:** Performed minor cleanup, such as renaming columns and ensuring data consistency.

2.3 Data Modeling

- Established relationships between Fact_Orders and dimension tables (Dim_Date, Dim_Date_Time, Products, Regions, Sales_Reps) using appropriate keys (e.g., Order_ID, Date, Product_ID, Region_ID, Sales_Rep_ID).
- Implemented a star schema model to optimize performance and usability in Power BI.

3. DAX Measures

The following DAX measures were created to enable dynamic calculations and drive the dashboard visuals:

- **#Customers:** Counts unique customers.
- **#Orders:** Counts total orders.
- **#Products:** Counts unique products.
- **Average_Order_Size:** $\text{DIVIDE}([\text{Total_Sales}], \text{SUM}('Sales'[\text{Quantity_Sold}]), 0)$ - Calculates the average order size.
- **MoM_Sales_Growth:** Calculates month-over-month sales growth percentage.
- **MoM_Sales_Growth_Text:** Formats MoM growth as text (e.g., "87.14%").
- **Profit_Margin:** $\text{DIVIDE}(\text{SUM}(\text{Fact_Orders}[\text{Profit}]), \text{SUM}(\text{Fact_Orders}[\text{Total_Sales}]), 0)$ - Calculates profit margin percentage.
- **Return_Rate:** $\text{DIVIDE}(\text{SUM}(\text{Fact_Orders}[\text{Returns_Sales}]), \text{SUM}(\text{Fact_Orders}[\text{Total_Sales}]), 0)$ - Calculates the return rate.
- **Total_Profit:** $\text{SUM}(\text{Fact_Orders}[\text{Profit}])$ - Aggregates total profit.
- **Total_Quantity:** $\text{SUM}(\text{Fact_Orders}[\text{Quantity_Sold}])$ - Aggregates total quantity sold.

- **Total_Sales:** SUM(Fact_Orders[Total_Sales]) - Aggregates total sales.
- **Variance_Period_MoM:** Calculates variance in sales between the current and previous month.
- **Variance_Period_YoY:** Calculates variance in sales between the current and previous year.
- **YoY_Sales_Growth_Text:** Formats YoY growth as text (e.g., "-1.07%").

These measures ensure dynamic and accurate insights across the dashboard.

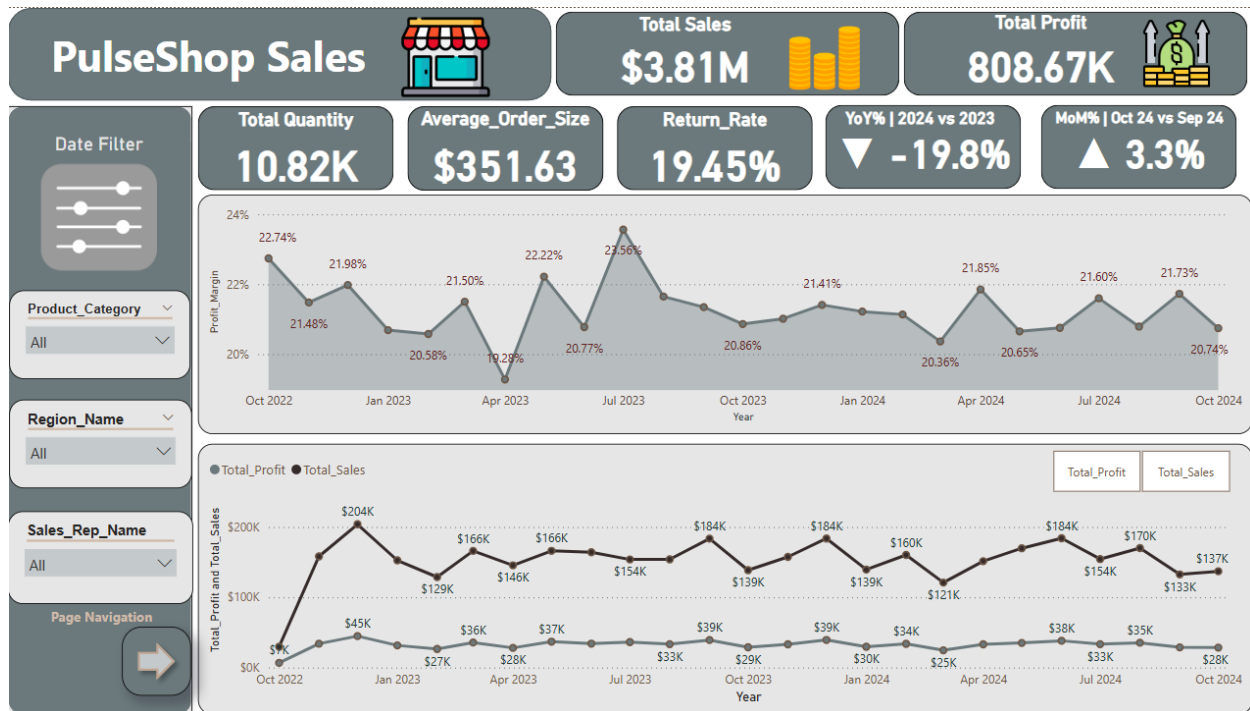
4. Dashboard Structure and Design

The dashboard comprises four pages, each addressing specific analytical needs and providing a holistic view of PulseShop's sales performance.

4.1 Page 1: Overview

- **Purpose:** Provides a high-level summary of key performance indicators (KPIs) and overall sales performance.
- **Content:**
 - **KPI Cards:**
 - Total Sales: \$3.81M using [Total_Sales].
 - Total Quantity Sold: 10.82K using [Total_Quantity].
 - Total Profit: \$808,670 using [Total_Profit].
 - Average Order Size: Using [Average_Order_Size].
 - Sales Growth Rates: [MoM_Sales_Growth] (e.g., 87.14%) and [YoY_Sales_Growth] (e.g., -1.07%).
 - Return Rate: Using [Return_Rate].
 - **Slicers:**
 - A dynamic date slicer (detailed in Section 5.1).
 - Additional slicers for Product_Category, Region, Sales_Rep, Dim_Date[Year], Dim_Date[Month], and Time_of_Day.
 - **Visuals:**

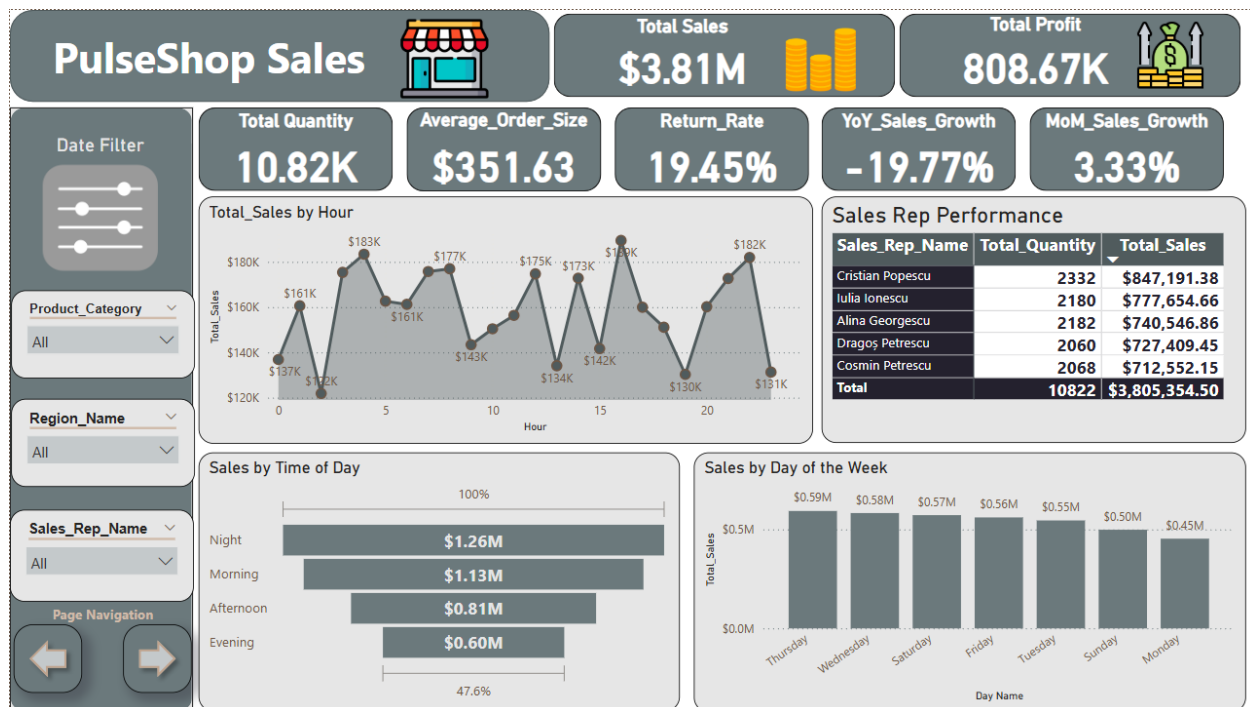
- Line Chart: Monthly and Yearly Sales Trends using $\text{SUM}(\text{Fact_Orders}[\text{Total_Sales}])$ over $\text{Dim_Date}[\text{YearMonth}]$, with $[\text{MoM_Sales_Growth}]$ on a secondary axis.
- Line Chart: Profit Margin Trends using $[\text{Profit_Margin}]$ over $\text{Dim_Date}[\text{YearMonth}]$.



4.2 Page 2: Trends Analysis

- **Purpose:** Analyzes sales trends over time, focusing on hourly, daily, and sales representative performance.
- **Content:**
 - **Visuals:**
 - Ranked Table: Sales Rep Performance using $\text{Sales_Reps}[\text{Sales_Rep_Name}]$, $\text{SUM}(\text{Fact_Orders}[\text{Total_Sales}])$, and $\text{SUM}(\text{Fact_Orders}[\text{Quantity_Sold}])$, highlighting Cristian Popescu, Iulia Ionescu, and Alina Georgescu as top performers.
 - Line Chart: Hourly Sales Distribution, identifying peaks at Hour 4 (\$183K), Hour 16 (\$189K), and Hour 22 (\$182K).

- Bar Chart: Sales by Time of Day using SUM(Fact_Orders[Total_Sales]) by Sales[Time_of_Day] (Night: \$1.26M, Morning: \$1.13M, Afternoon: \$0.81M, Evening: \$0.6M).
- Bar Chart: Sales by Day of the Week using SUM(Fact_Orders[Total_Sales]) by Sales[Day_of_Week] (Thursday: \$0.59M, Monday: \$0.45M).
- **Parameter Feature:** Added a parameter to the Total Sales and Total Profit visual, allowing users to toggle between Year, Month, or both, with a default combined view if no selection is made.

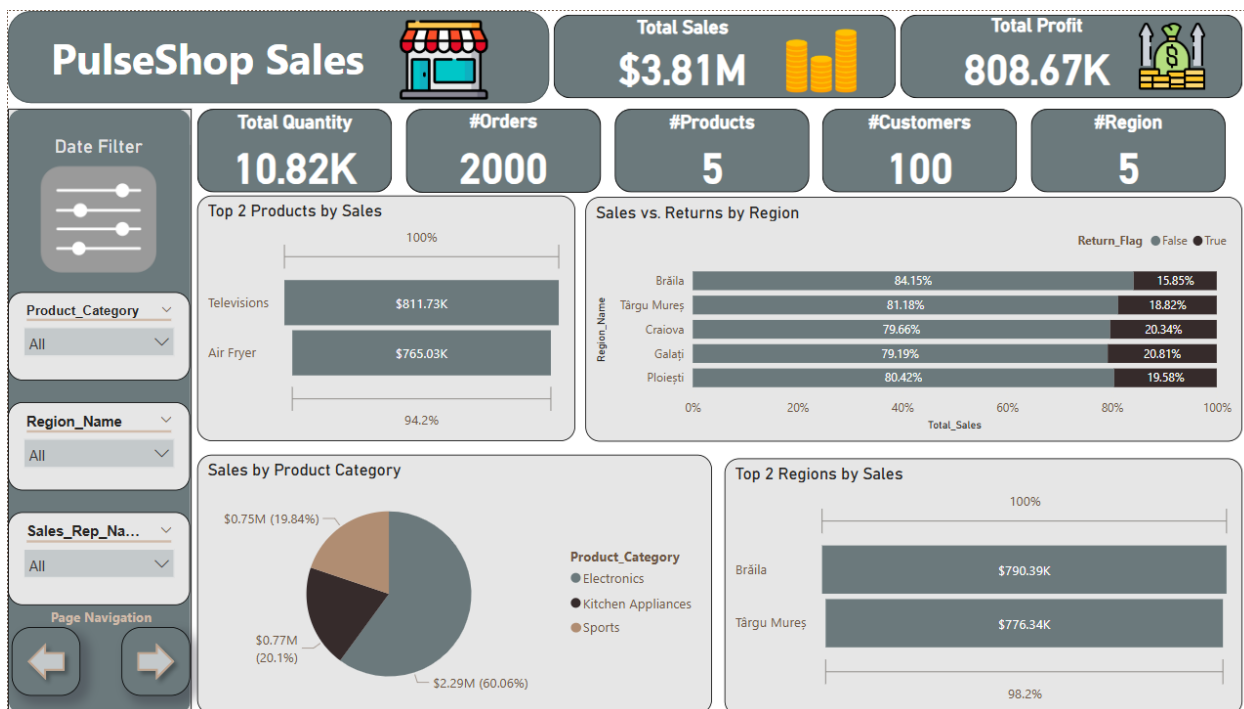


4.3 Page 3: Performance Details

- **Purpose:** Provides detailed performance analysis by products, regions, customers, and sales representatives.
- **Content:**
 - **Cards:**
 - #Orders: Using [#Orders].
 - #Products: Using [#Products].
 - #Customers: Using [#Customers].
 - #Regions: Counts unique regions.

- **Visuals:**

- Funnel Chart: Top 2 Products by Sales using Products[Product_Name] (e.g., Televisions, Air Fryer) for better comparison.
- Funnel Chart: Top 2 Regions by Sales using Regions[Region_Name] (e.g., Brăila, Târgu Mureș) for better comparison.
- Stacked Bar Chart: Sales vs. Returns by Region, analyzing the proportion of returns (Return Flag) within each region.
- Pie Chart: Sales by Product Category, illustrating the contribution of each category (e.g., Electronics at 60.06%).



4.4 Page 4: Insights & Recommendations

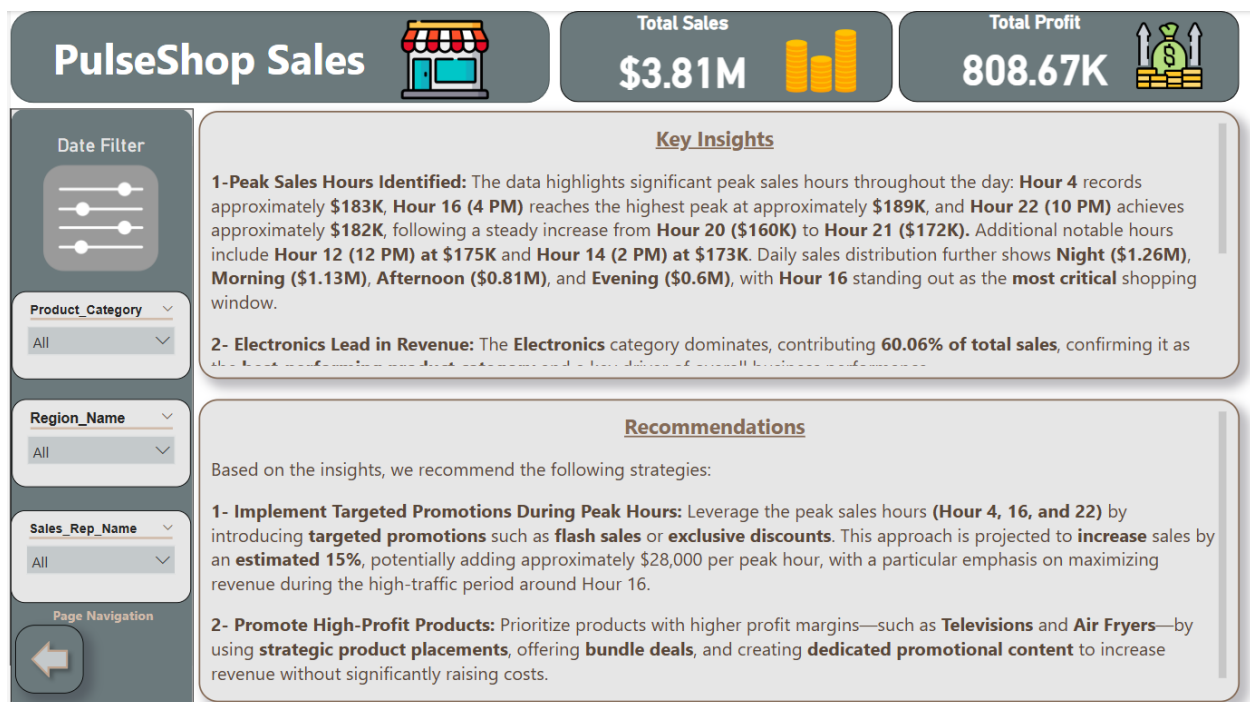
- **Purpose:** Summarizes key findings and provides actionable strategies for sales improvement.
- **Content:**
 - **Actionable Insights:**
 1. **Peak Sales Hours Identified:** Hour 4 records approximately \$183,000, Hour 16 (4 PM) reaches the highest peak at \$189,000,

and Hour 22 (10 PM) achieves \$182,000, with Night sales at \$1.26M.

2. **Electronics Category Drives Revenue:** Electronics dominate sales, contributing 60.06% of total revenue .
3. **Thursday Exhibits Strongest Weekly Sales:** Thursday stands out as the peak sales day, generating \$0.59 million, while Monday records the lowest sales at \$0.45 million.

○ **Recommendations:**

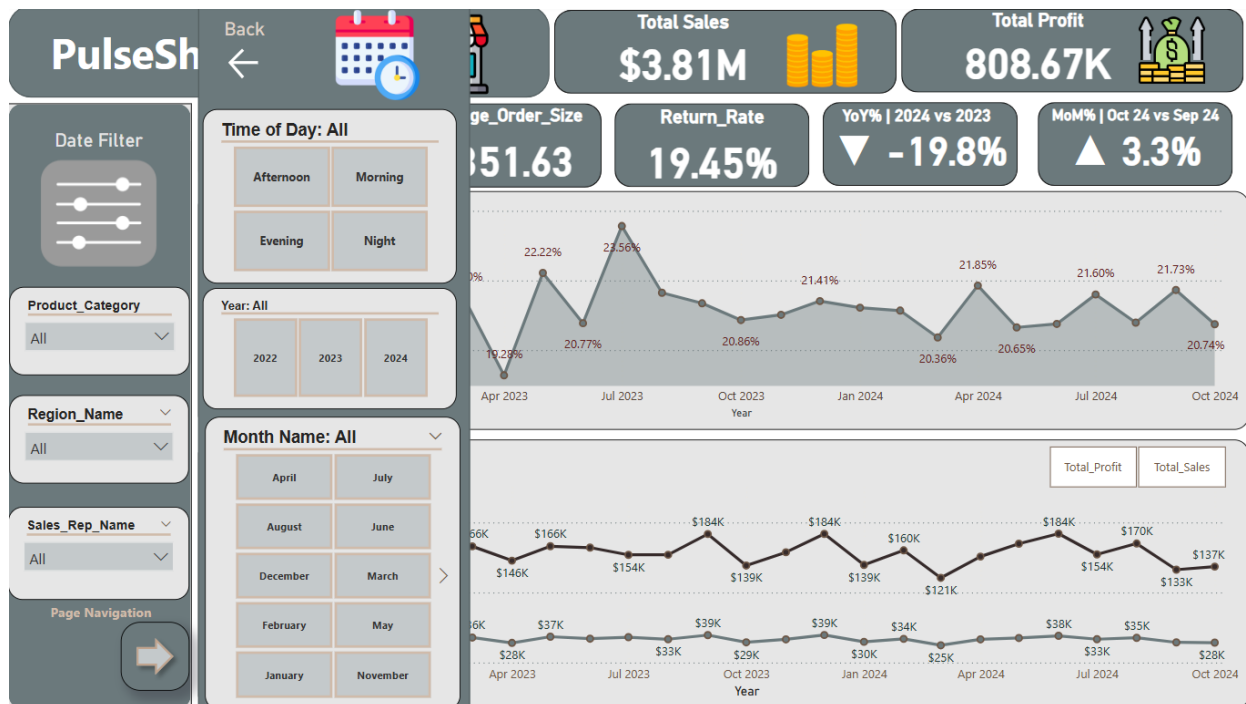
1. **Implement Targeted Promotions During Peak Hours:** Leverage peak sales hours (Hour 4, 16, and 22) with flash sales, projecting an estimated 15% sales increase (\$28,000 per peak hour).
2. **Thursday-Focused Campaign with Loyalty Incentives:** Launch a "Weekend Prep Campaign" on Thursdays with loyalty rewards, collaborating with top sales reps like Cristian Popescu, anticipating a 10% sales uplift (\$59,000).
3. **Promote High-Profit Products:** Prioritize products with higher profit margins, such as Televisions and Air Fryers, by using strategic product placements, offering bundle deals, and creating dedicated promotional content to increase revenue without significantly raising costs.



5. Additional Features and Enhancements

5.1 Interactive Date Slicer with Bookmark

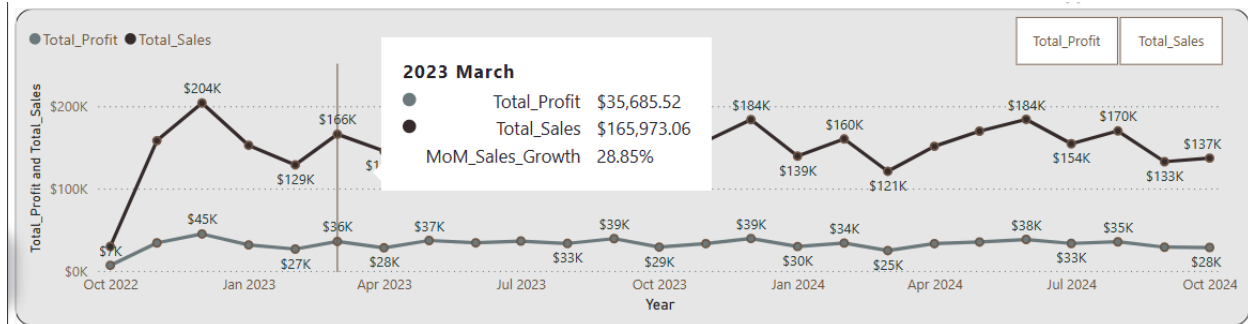
- **Feature:** Implemented a dynamic date slicer using a Bookmark for enhanced user interaction.
- **Implementation:**
 - Added a Shape (e.g., a calendar icon) that triggers a Bookmark to display a hidden date slicer panel when clicked.
 - The date slicer allows filtering by Dim_Date[YearMonth] or other date attributes.
 - Below the date slicer, added slicers for Product_Category, Region, and Sales_Rep.
 - Included a Page Navigator on the right and left sides for seamless navigation between dashboard pages.



5.2 Parameter for Total Sales and Total Profit

- **Feature:** Added a parameter to the Total Sales and Total Profit visual on the Trends Analysis page.
- **Implementation:**

- Users can toggle between Year, Month, or both dimensions to view sales and profit trends.
- If no selection is made, the visual defaults to a combined view of Year and Month.



5.3 Design Consistency

- **Color Scheme:** Used a consistent palette (gray and yellow) across all pages.
- **Navigation:** Added a Page Navigator for improved usability.
- **Visual Enhancements:** Incorporated advanced visuals like Funnel Charts, Stacked Bar Charts, and Word Clouds for deeper insights and a modern aesthetic.

6. Conclusion

The Power BI dashboard for PulseShop delivers a robust solution for analyzing sales performance across time, products, regions, and sales representatives. The four pages provide a holistic view of the business, supported by dynamic DAX measures, interactive features like the date slicer bookmark and parameter toggles, and actionable insights. The Insights & Recommendations page empowers the company to optimize sales strategies, target peak hours, and leverage high-profit products and top performers like Cristian Popescu. This project demonstrates analytical depth, technical proficiency, and a user-focused design approach, ensuring actionable outcomes for PulseShop.

Attachments

- **Power BI File:** [PulseShop_Dashboard.pbix](#)
- **Database File:** [PulseShop_sales.xlsx](#)